Service Design on Reuse of Urban Surplus Food

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Abstract. With the goal of alleviating the pressure on social resources, to find the correlation between food waste at the consumer end and the food and clothing of the disadvantaged, and to create opportunities for the urban subsistence and unemployed people to "work for food" and re-employment, to explore Innovative help strategy. Understand the objectives, behaviors, and opinions of the research objects, summarize the content of questionnaires and interviews, establish user role models through user demand analysis, and draw user experience maps for functional conversion. The framework of food reuse service is established. Based on the visualized way of service blueprint, the physical products, user APP and operation process of urban food reuse are designed, which changes the original one-way development of the service into a sustainable and benign closed-loop development, providing a reference for the design of other social public welfare service.

Keywords: Surplus Food; Disadvantaged Groups; Labor for Food.

1. Introduction

For the first time, the United Nations put forward the idea of rethinking how to grow, share and consume food, in order to ensure that the goal of eradicating hunger by 2030 is achieved. In China's entire food supply chain, the consumer end is the link that accounts for the largest proportion of food loss [1]. my country has paid more and more attention to food waste and the food and clothing of disadvantaged groups, so that there have been many pure public welfare relief organizations in the society. Food will condone the inertia of disadvantaged groups and cannot form a virtuous cycle of development. Designing the reuse of urban surplus food based on the perspective of sustainability and fairness may be able to propose different innovative ideas for the solution of food waste.

2. Analysis of the Current Situation on Reuse of Urban Food

The current situation of our country with the development of social economy and the improvement of people's living standards, extravagance and waste have become popular, especially food waste has become more and more serious. In 2018, the China Urban Catering Food Waste Report jointly issued by the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences and the World-Wide Fund for Nature pointed out that my country's catering industry wastes between 17 million and 18 million tons of food each year, enough for 30-50 million people. Eat for one year [2]. Most of the wasted food is still edible in compliance with national food safety monitoring.

In my country's catering industry, fewer and fewer surplus foods are sent to feedlots as swill, and many of them are thrown away directly as garbage; there is no other way to deal with the products that are about to expire in supermarkets except for discounting; so many foods have no value in themselves It has been reflected, and the country must spend a lot of money for processing and destruction. Due to the weak ecological foundation and weak foundation of my country's resources and environment, this inappropriate food consumption in the current society and the pressure on resources and environment brought by it has become an important bottleneck restricting the healthy and sustainable development of my country's social economy [2]. Although our country has taken a number of measures to reduce food waste, governments in many places are also very concerned about the problem of reusing surplus food, such as the "Oasis Food Bank" in Shanghai, the "Hundred Food Bank" in Guangzhou, and the "Food Bank in Qingdao". It is of a pure public welfare nature, and how to make the food reuse economical and sustainable remains to be considered

3. The Significance of Service Design on Reuse of Urban Surplus Foo

3.1 Reduce Food Waste and Save Resource

According to statistics, the per capita waste in the urban catering industry is 96 grams per meal, with a waste rate of 11.3%; the waste rate of large gatherings reaches 38%; and one third of student box lunches are thrown away [2]. The General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the "Opinions on Strict Economy and Opposing Food Waste", proposing to eliminate waste of meals in official activities and promote thrifty meals in unit canteens. In 2013, the nationwide call for "CD Action" [3]. The design of the urban surplus food reuse service helps to alleviate the problem of food waste at the consumer end, while reducing the pollution of resources and the environment, and promoting the conservation and reuse of resources.

3.2 Alleviation of the Disadvantaged Groups' Problem While Promoting the Healthy Development of the Hungry

The advantage of the urban surplus food reuse service design is based on the service design concept of "Teaching people to fish is not as good as teaching people to fish", and provides a set of solutions for the benign interaction between the labor behavior of disadvantaged groups and food reuse. Based on the service design concept of "Gives the human by the fish to be inferior gives the human by the fishing.", the most important thing is to ensure the healthy development of the serviced groups. It not only considers the provision of food from the outside, but also helps the disadvantaged groups to affirm their own value from the inside. The process of giving surplus food to the "hungry people" also provides them with new ways to find work. Based on the existing national assistance mechanism for vulnerable groups, through the establishment of an online and offline integrated urban food reuse service model, the service process has changed from the original one-way development to a circular and sustainable benign closed-loop development, so as to alleviate food waste and improve reuse At the same time, it will further affirm the value of disadvantaged groups, increase their enthusiasm for social participation, and provide innovative solutions to the problem of urban "hungry people".

4. User Research

4.1 Stakeholder Analysis

Combining the results of the questionnaire survey, sort out the various participant relationships designed by the food reuse service, and make a stakeholder map, see Fig. 1. Conducted in-depth interviews with low-income groups. During the interviews, it was found that different people have different concerns about the urban food reuse service system, but the interview results are mostly demand-oriented, and most people have a high degree of social service a sense of identity, willing to try the innovative model of "urban surplus food reuse service ".

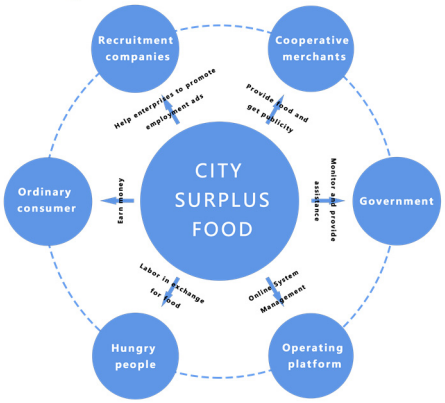

Fig 1. Stakeholder Map

4.2 Insight of User Needs

By adopting a random sampling method to conduct a questionnaire survey on the food reuse service, the survey targets ordinary consumers and low-income groups. This questionnaire finally obtained 312 valid questionnaires. It can be seen from "How much uneaten clean food is left in general" that most people will have "10-20%" surplus food, and it can be seen from "How to deal with remaining food" that most people will choose "Throw away directly" or "pack and take away." As for the "attitudes and opinions of the urban surplus food reuse service", it can be seen that many people are still very concerned about food waste and support that food reuse can help others.

Through a detailed analysis of the user group, compared with ordinary people, the disadvantaged group has some characteristics that are unique to this group in terms of physiology and psychology. Only by transforming these characteristics can we truly design the reuse of surplus food suitable for the disadvantaged group service. (1) Physiological needs, the remaining food provided is fresh, not the remaining food after others eat, can be full, food safety is guaranteed. (2) Psychological needs, including the realization of personality respect and self-worth. They are eager to receive equal treatment based on providing food and clothing, and not to be treated as a special group. They are more eager to get the corresponding food through their own contributions, rather than blindly receiving unilateral grants from the government and society. Therefore, they are eager to realize their self-worth through reasonable regulation channels to be recognized by the society, and then to solve their own physiological needs.

Physiological needs are basic needs and are often the easiest to achieve. Psychological needs, as deep-seated needs, need to be fulfilled in many ways. Therefore, psychology is often easily overlooked. The satisfaction of psychological needs can effectively solve the problem of food and clothing for disadvantaged groups.

4.3 Establishment of User Role Model

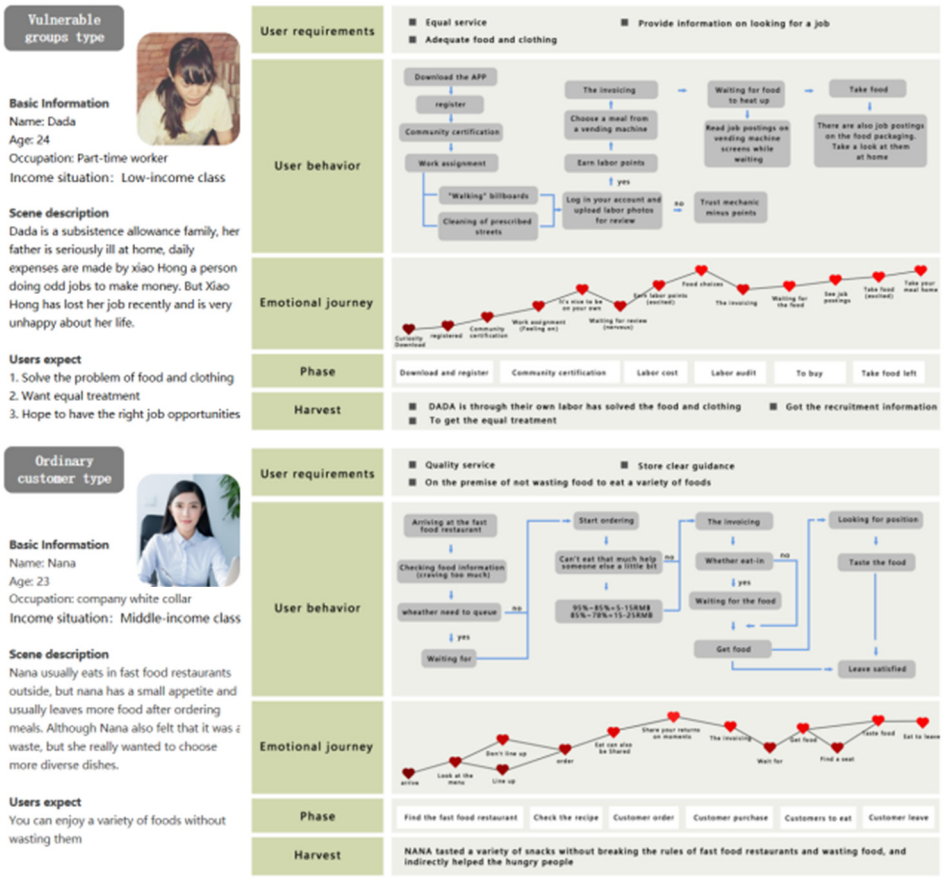

Fig 2. Target user role model

The user role model is a very effective user experience design tool. It is a collection of the key characteristics of all target users. Through personas, the design team can always put users in the first place, thereby digging into the potential needs of target users. Guide the design process [4]. By summarizing and analyzing user needs and behavior characteristics, the types of service target users are determined from the two dimensions of surplus food reuse and food and clothing for disadvantaged groups, and two user role models are constructed and described, see Fig. 2, in order to accurately grasp Interview key data and information, effectively assisting subsequent decision-making and plan design.

5. Service Design Strategy for Reuse of Urban Surplus Food

5.1 Emphasis on the Equalization and Hommization Analysis of "Work for Food"

The user role model is a very effective user experience design tool. It is a collection of the key characteristics of all target users. Through personas, the design team can always put users in the first place, thereby digging into the potential needs of target users. Guide the design process [4]. By summarizing and analyzing user needs and behavior characteristics, the types of service target users are determined from the two dimensions of surplus food reuse and food and clothing for disadvantaged groups, and two user role models are constructed and described, as shown in Figure 2, in order to accurately grasp Interview key data and information, effectively assisting subsequent decision-making and plan design.

5.2 Consideration for the Innovation of Offline Meals

In line with the people-oriented and innovative nature of service process design, first, it is necessary to increase the offline end and use tangible product media for buffet meal access, to weaken the identity characteristics of disadvantaged groups when taking meals. For example, meals can be combined with meals. The combination of self-service vending machines makes it difficult to distinguish between ordinary consumer groups and disadvantaged groups during the retrieval process, and eliminates the psychological barrier of disadvantaged groups. Secondly, it should also consider whether the disadvantaged groups can be provided with additional services when obtaining food, such as heating or short-term meal services, to enhance the satisfaction of the served.

5.3 Formation of a System by Integrated Service Online and Offline

The sustainable product service is based on the overall consideration of "economy-society-environment", based on the stakeholders to create an innovative design of products and service, designers not only pursue economic development in the design, and constantly thinking about and forming new solutions for environmental and social development. In order to ensure that the service is effective and reasonable, and is truly implemented to the people being served, it connects with the existing national assistance mechanism for vulnerable groups and crowd authentication. The online database is imported for the vulnerable groups. The user performs personal authentication in the app, and the offline end takes meals. It is necessary to scan the online identification code to verify the validity of its identity to form an effective online and offline closed-loop service.

6. Service Design for Reuse of Urban Surplus Food

6.1 Construction of the Service Model

Through the integration of tangible products and online and offline service, guided by the actual needs of users, the respective functions and service content are further optimized, and the urban surplus food reuse service model is constructed, see Fig. 3. The urban surplus food reuse service is centered on self-service vending machines, and is composed of three modules: online service platform and offline meal recycling and reuse. The three relatively independent modules have material or

service information transmission and Interactive, the overall service is led by the government. Online service platform companies and businesses provide recruitment information and public welfare positions, and social service demanders publish service needs, providing low-income groups with employment and "work for food" opportunities. Vulnerable groups certified by the government can choose to save in their personal accounts by completing tasks and earn meal points, and then exchange for meals through their own vending machines. The offline selection of reasonable business meals is the object of meal recycling, and ordinary consumers are the main providers of meal resources, and they have the right to know and the right to dispose of them at the time of recycling. After the clean surplus food is recovered, it needs to be disinfected and sterilized. The standard lunch box with the service design logo is uniformly packaged for the second time and then transported to the self-service vending machine. The self-service vending machine not only serves as the physical touch point for the meal exchange of the disadvantaged group, avoiding the psychological suggestion of the "unique identity" when the group exchanges for the meal, but also serves as a normal catering vending machine to provide a new flow of funds for the service.

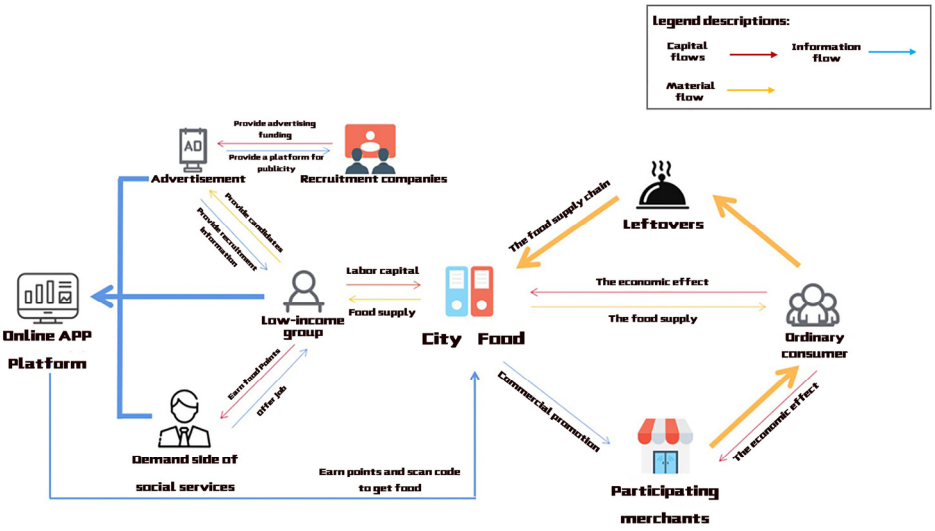

Fig 3. Urban surplus food reuse service model

6.2 Service Blueprint

Based on the construction of the urban surplus food reuse service, the service blueprint is further drawn, see Fig. 4, which shows the visualized results of the food reuse. Through the service blueprint, the complete service process and the steps and methods for realizing the service can be described intuitively. In the optimized service process, ordinary consumers consider their own food intake when ordering meals and then refer to the food ration standards provided by the merchants, choose whether to provide meals to the disadvantaged groups, and choose what percentage of the food they order for gifting. As an important part of food waste, the link reduces food waste from the consumer end to the reuse of surplus food for disadvantaged groups.

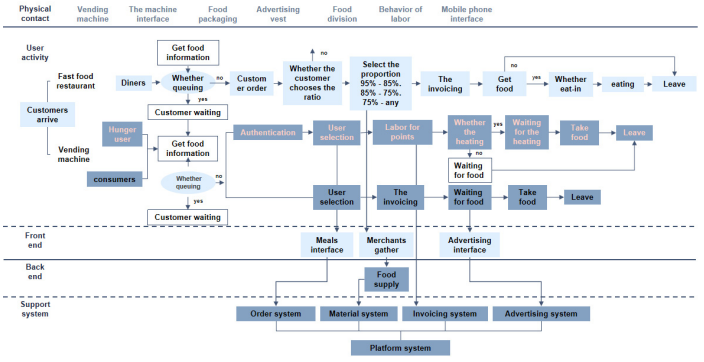

Fig 4. Service Blueprint

6.3 Customer Journey Map Design of the Service

The food rations of most businesses cannot satisfy all consumer behaviors, and ordinary consumers know their food intake, so they can choose whether to share part of the food when ordering. The shared food is packaged in a unified standard lunch box by the merchant, and then delivered to each self-service vending machine by the service staff. At the same time, the disadvantaged groups who have no job can solve the problem of food and clothing through the APP for identity authentication-receive tasks-complete tasks-earn points, go to the self-service vending machine to exchange for meals, and at the same time can browse recruitment information to solve their unemployment problem, see Fig. 5.

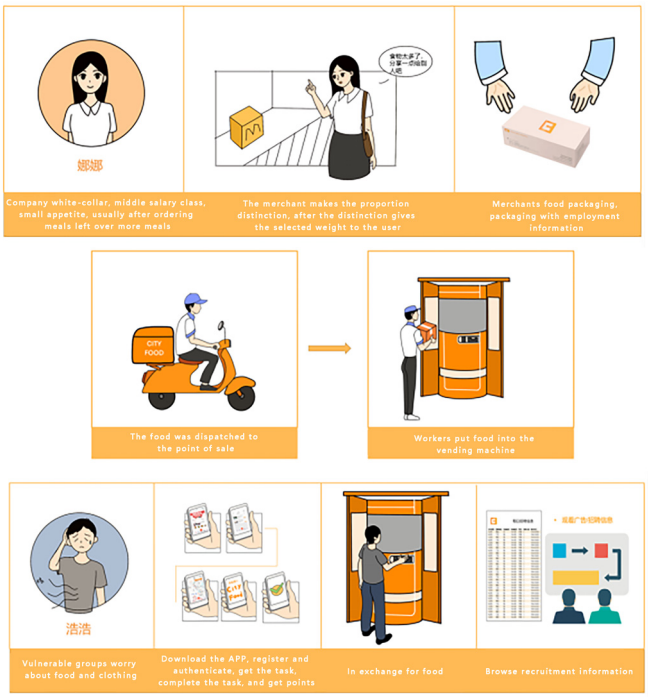

Fig 5. Operation flow chart

6.4 Physical Contact of Service--Design of the Vending Machines

Material touchpoints are an important part of this service. Although they serve as an effective capital flow to support the economic operation of the service, they are also offline terminals that provide services to users in the. The functionality and functionality of self-service vending machines must still be considered. Color matching meets the empathy needs of disadvantaged groups while not highlighting the use of group characteristics. Consider integrating meals and traditional drinks, re-planning the effective use of space, dividing the storage cavity of the vending machine into upper and lower partitions, combining the existing methods of pushing and dropping, placing drinks in the upper half and placing drinks in the lower half. Place meals, the two independent mechanical arms in the middle can move up and down, telescopic and stably take meals, and there is a heating device at the exit of the warehouse to selectively heat the meals. The self-service vending machine is composed of a hexahedron. Users can order food at two ordering ports or on two temporary dining boards. There is a display screen for advertising and recruitment information.

6.5 The Digital Contact of Service--Design of APP Client

The design of the homepage of the client of the service APP is shown in Figure 6. Personal identity information authentication is required for the first use to complete the connection of the back-end database. The APP can scan the code for the self-service vending machines under the connection to perform visual ordering services. You can see the types of meals and the points required to redeem

the meals, and you can also see the location of nearby self-service vending machines on the map. The platform can see the release of social labor tasks. Users can choose according to their own situation when using them. Each task will have detailed instructions. After accepting a task, there will be map navigation and the steps to complete the task. If it does not meet your own requirements, it is expected that the task can be canceled in a short period of time, and the number of cancellations per month is limited. If the number of cancellations exceeds the number, the user's reputation score will be reduced. The job search information page can provide employment needs for the unemployed with labor ability, not just for public welfare positions in exchange for meals, to help the group re-participate in society. In the "My" page, there will be work records, points and credit mechanism points, so that users can better understand the content of personal information, as shown in Figure 7.

Fig 6. APP interface

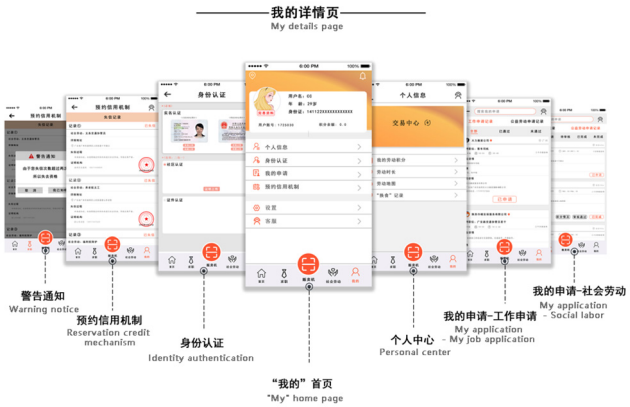

Fig 7. APP interface-My details page

7. Conclusion

This article takes the urban food waste problem and the food and clothing problem of the disadvantaged groups as the starting point. Through user research, problem analysis and opportunity mining are carried out, and the help strategy of reducing food waste at the consumer end is proposed by consumers giving the disadvantaged groups excess food. Combining the hungry people with "work for food" makes the service change from the original one-way development to the sustainable and circular development of a benign closed loop. This paper maintains an equal relationship between hungry people and normal consumers, protects low-income groups, promotes cooperation and reciprocity among social enterprises, businesses, and governments, finds sustainable economic ways for limited social resources, and provides new solutions.

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